

groups of birds ; and hence a new subclass, *Odontornithes*, is proposed for them. The order may be called *Ichthyornithes*.

The species lately described by the writer as *Ichthyornis celer* also had biconcave vertebræ and probably teeth. It proves to be generically distinct from the type species of this group, and hence may be named *Apatornis celer*, Marsh. It was about the same size as *Ichthyornis dispar*, but of more slender proportions. The geological horizon of both species was essentially the same. The only remains of them at present known are in the museum of Yale College.

The fortunate discovery of these interesting fossils is an important gain to palæontology, and does much to break down the old distinctions between Birds and Reptiles, which the *Archæopteryx* has so materially diminished. It is quite probable that that bird, likewise, had teeth and biconcave vertebræ, with its free metacarpals and elongated tail.—*Amer. Journ. of Science and Arts*, vol. v., Feb. 1873.

*On two new Free Sponges from Singapore.*

By Dr. J. E. GRAY, F.R.S. &c.

Dr. A. B. Meyer has sent to the British Museum five specimens of free sponges (four of them belonging to one species, and the other to a separate one), which I believe were obtained in the neighbourhood of Singapore.

The one is very like *Tetilla polyura* of O. Schmidt ('Spongienfauna des atlantischen Meeres,' t. vi. f. 8), which is the type of my genus *Lophiurella*, but differs from it in several particulars ; and the other is a form which has not hitherto occurred to me.

It has been thought that these free sponges are only the young and free state of sponges which become attached in their older state ; but this theory wants further confirmation. *Tetilla polyura* of Schmidt might be young, as it is only  $\frac{1}{3}$  inch long ; but the specimens from Singapore are more than 2 inches in diameter and length.

The four specimens, which I have called *Psetalia globulosa*, exhibit four different states of growth, the sponge being considerably modified in its general form as it enlarges.

The youngest specimen, about  $\frac{1}{3}$  inch in diameter, is half-oblong, with a few conical projections on the lower part, each ending in a tuft of spicules, and with a flattened upper surface having a small central opening leading to the inner surface.

In a larger specimen, about  $1\frac{1}{2}$  inch in diameter, the conical prominences on the under surface, each ending in a tuft of elongate spicules, are more numerous, and the upper surface is produced, conical, and ending in a much larger central opening.

In the largest specimen, about  $2\frac{1}{2}$  inches in diameter, the sponge is irregularly conical below, the surface being covered with distinct, rather prominent, tubercles, each containing a tuft of elongate filamentous spicules, ending below, as in the other specimens, in three or more recurved anchoring spines. The upper surface is deeply concave, with only a broad convex margin, incurved, edging the concavity. This, like that of the interior of the other specimens,

has a series of rounded oscules, that are small near the margin and gradually increase in size as they approach the centre, where the oscules become united into two very large oblong rather sinuous holes. The outer surface of this sponge exhibits a quantity of small circular holes interspersed among the tubercles which bear the bunches of spicules.

The other sponge I have named *Labaria hemisphærica*. It is hemispherical, about 2 inches in diameter, and rather more than 1 inch high, with a rather smooth outer surface and a rather deep regular concavity on the upper surface, which seems formed of interlacing spicules, leaving considerable spaces between them. The outer surface and its margin are scattered with distant, but rather regularly placed, cylindrical perforations, from the centre of which are emitted tufts of elongated filiform spicules, diverging in all directions from the surface of the sponge. The middle of the underside deeply concave, with a well-defined edge, from which is emitted a very large tuft of very numerous crowded spicules, forming a kind of brush, each filament when perfect ending in three short recurved spines.

Mr. Carter will give a further account of these sponges, with descriptions of the spicules of which they are formed, in his account of the sponges in the British Museum.

*On the "Capreolus" of Zonites algirus.* By E. DUBREUIL.

In our anatomical and historical investigation of the generative apparatus of the *Helices*, we have noticed the presence of a spermatophore in *Zonites algirus*, and described the *capreolus* of that species, which had not been indicated by any malacologist.

This body, 26 millims. in length and 1 millim. in breadth at its most inflated portion, is of a tubular form, diminishing in size on both sides from its inferior third. It is a complete canal, furnished with numerous spiral channels. A transverse section made about its middle has the aspect of a cogged wheel furnished with from twelve to fourteen little teeth. Its superior extremity terminates in a tube with a capillary aperture, where the lamellæ disappear; whilst the other, where they are more distinct, is shorter and presents a wider orifice. It is covered with an albuminoid membrane.

When the introduction of the *capreolus* is completed, its inferior extremity, curving into the arc of a circle, inserts itself for three, four, or five millimetres into the neck of the oviduct, which, in this species, is destitute of a transverse muscle. This extremity is enveloped by a whitish viscous matter, which escapes from the interior of the spermatophore, and contains an infinity of spermatozoids. The issue of these from the interior of this appendage is due to the action of the muscular membrane of the copulatory canal.

A part of the inferior deferent duct is destined to the production of the *capreolus*. This duct, which measures 50 millims. in extent, has not the same volume throughout its length. From its point of junction with the deferent channel for a distance of 31 millims. its diameter is  $\frac{1}{3}$  or at most  $\frac{1}{2}$  millim., whilst in the second half of its